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Studies in *Sisyrinchium*—X. The species of California

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The blue-eyed grasses of California, as shown by the collections which have passed under review in a study of the group, are common in many parts of the state and in nearly all parts are represented by one or more species, forming a noteworthy if not everywhere conspicuous element in the flora.

The widely diversified topographical features and sharply contrasted climatic conditions embraced within the great area of the state might well lead us to expect some striking reflection in so responsive a genus as *Sisyrinchium* occurring throughout, more especially since so many other sections of the United States have been found to possess a more or less characteristic group of species, and yet it has long been commonly supposed that scarcely more than a single species belonged to the California flora. In fact since Dr. Watson, in 1877, separated the most conspicuous California species from its eastern relatives under the name of *Sisyrinchium bellum* this name has been in common use for almost all specimens collected within the boundaries of the state.*

Within these boundaries, however, is an interesting group of species few of which appear to extend far beyond them. How many species make up this group cannot as yet be determined. Six or seven come out clearly enough from the mass of specimens which have been available for study, and others might be proposed on evidence perhaps sufficient yet not altogether convincing. For the present seven species are recognized. Of these *Sisyrinchium bellum*, the most conspicuous, appears also to be the most abundant. It proves, however, to be not at all of general distribution

* The yellow-flowered species formerly included in *Sisyrinchium* are here excluded from consideration, having already been separately treated under the revised genus *Hydastylus*. (Studies in *Sisyrinchium*—VIII. Bull. Torrey Club, 28: 570-592. 1901.)

The even more distinct genus *Olsynium* of Rafinesque takes over another plant long accepted as a *Sisyrinchium*, the *Sisyrinchium grandiflorum* Douglas, as already pointed out. (Studies in *Sisyrinchium*—VII. Bull. Torrey Club, 27: 237. 1900.)

throughout the state, being restricted, or very nearly so, to the coastwise counties, through which it ranges from San Diego, and doubtless Lower California, northward into Mendocino County, from beyond which no specimens have been forthcoming. This species bears the distinction of having flowers of larger maximum size than any other species of the United States, although surpassed in both the size and beauty of its flowers by *Sisyrinchium Macounii* of Vancouver Island.

In the Sierra Nevada region, northward from about the middle of the state, and beyond into Oregon, *Sisyrinchium bellum* is replaced by a slighter and smaller-flowered plant, *Sisyrinchium Greenei* sp. nov., which appears to be generally representative of that region, while in the valleys and mountains of the southern part of the state away from the coast another species, *Sisyrinchium Eastwoodiae* sp. nov., appears to be equally representative. A further, somewhat obscure species from the southwestern ranges nearer the coast is admitted as *Sisyrinchium hesperium* sp. nov. Four species appear from the extreme eastern parts of the state, one very distinct and apparently local species, *Sisyrinchium funereum* sp. nov., in the southeast, and three, *Sisyrinchium halophilum* Greene, *Sisyrinchium leptocaulon* Bicknell and *Sisyrinchium oreophilum* sp. nov., all simple-stemmed plants, mostly in the Sierra Nevada region.

SISYRINCHIUM HALOPHILUM Greene, Pitt. 4: 34. 1899.

Inyo County, *Bishop*; Owen's Valley, alt. 5,000 ft., May 15, 1897, *M. E. Jones*, Herb. Missouri Bot. Gard. (not U. S. Nat. Herb., as cited in error Bull. Torrey Club, 26: 451. 1899); Sierra Nevada Mts., 1875, *J. G. Lemmon*, U. S. Nat. Herb.

These specimens are stouter and broader-leaved, with thicker roots and perhaps larger flowers than the type, but are without perfect flowers and fruit and can be referred to no other species at present described.

The range of *S. halophilum* may be extended to Idaho, Wyoming and Colorado. From these states come a series of small, slender plants which, while contrasting markedly with the specimens from California cited above are brought closer to them by somewhat intermediate characters found in the Nevada type. The principal differences from the latter are more slender, less clustered roots, slenderly prolonged outer bract and apparently larger and darker-colored, thinner-walled capsules.

There seems, indeed, good reason to suspect the existence of a group of closely related simple-stemmed species inhabiting nearly the same general region, which on present material it is impossible to disentangle effectually from *S. halophilum* and *S. leptocaulon*.

SISYRINCHIUM LEPTOCAULON Bicknell, Bull. Torrey Club, **26**: 451. 1899.

Sierra Nevada Mts., near Lake Tahoe, *J. Ball*, July 20, 1884, Herb. Acad. Nat. Sci. Phila.

Tuolumne Co.: Soda Springs, Herb. Cal. Acad. Sci.

Lassen Co.: Milford, June 26, 1892, *T. S. Brandegee*, Herb. Cal. Acad. Sci.

The original description of *S. leptocaulon* was drawn from the specimen first above cited together with other material from Nevada and Utah less evidently distinct from *S. halophilum*. Of the additional specimens here recorded, that from Soda Springs, while clearly related to the Lake Tahoe type, shows a greater size for the species and a wider divergence from *S. halophilum* than has hitherto appeared. The stiff, narrowly margined stems are 45–70 cm. tall and about 1.5 mm. wide; the broadest leaves, nearly 2.5 mm. wide, are strongly rather few-nerved and more or less white-glaucous; the bracts are finely close-striate, the outer one stiffly short-pointed, scarcely surpassing the inner, and 2–2.5 cm. long; inner scales crowded, sometimes exceeding the shorter bract; pedicels close-fascicled, somewhat exserted; capsules pale, thick-walled, finely rugulose, 2.5–5 mm. high; seeds 2–3 in a row; a mature seed is nearly 2 mm. in diameter, irregularly compressed-subglobose and very minutely rugulose.

It is impossible to derive a clear understanding of either this species or *S. halophilum* from the scant material so far collected. While extreme examples of each appear obviously distinct, their relationship is confused by certain specimens which cannot be satisfactorily assigned at the present time. As already intimated there is good reason to believe that more than two species enter into the problem.

Sisyrrinchium oreophilum sp. nov.

Stems simple, or occasionally developing a single terminal peduncle with subtending leaf, 10–25 cm. high from slender fibrillose roots; pale glaucescent green, showing some discoloration when dry. Leaves about half the height of the stems, firmly

erect, becoming rather strongly nerved, 1-3 mm. wide, tapering-acute, the edges smooth; stems .75-1.50 mm. wide, narrowly wing-margined, finely cartilaginous-denticulate to smooth; spathes narrow, the bracts rather prominently but not very closely finenerved, the hyaline edges narrow; outer bract 1.5-4 cm. long, narrowly attenuate, abruptly pointed or often obtuse, usually surpassing the inner one 2-10 mm., but sometimes longer, rather closely united-clasping for 5-7 mm. and with sharply keeled edges; inner bract usually abruptly scarious-obtuse and bluntly apiculate; inner scales little more than half the length of the bracts; pedicels erect, slightly exserted, often reddish-purple; flowers violet-purple; perianth 8-10 mm. long, the segments mucronulate-aristulate, slightly if at all emarginate; staminal column 5 mm. long or less; anthers small, about 1 mm. long; ovary oblong, puberulent; capsule sparsely puberulent, brown, thin-walled, globose or obovoid, 2.5-5 mm. high, many seeded.

Mariposa County: Yosemite Valley, May-June, 1900, *F. T. Bioletti*, Herb. Cal. Acad. Sci. (type); Yosemite Valley and Mountains, *J. Torrey*, 1865, Herb. Columbia Univ.; Sierra Nevada Mountains, 8,000 ft., south fork of San Joaquin River, July, 1900, *H. M. Hall & H. P. Chandler*, no. 652.

Placer County: Downer Lake, July 25, 1895, *Edward L. Greene*, Herb. E. L. G.

Modoc County: 1894, *M. S. Baker and Frank Nutting*, Herb. E. L. G.

Appearing nearer to *S. angustifolium* than any species seen from west of the Rocky Mountain region, and variously suggestive, as well, of some of the simple-stemmed western species, but showing material differences from each one. It is a smaller plant than *S. angustifolium* with less unequal and more obtuse bracts of somewhat different nervation, smaller flowers with small anthers and more glandular-puberulent ovary, the capsules also more or less sparsely puberulent.

In the relative length of the bracts this species nearly agrees with *S. occidentale*, but it differs notably in much smaller flowers, less acute and differently shaped bracts, especially the narrower inner one, weaker and less narrowly margined, mostly rough-edged stems and more slender roots.

S. segetum is also much larger flowered, as well as taller and more slender, more densely tufted, narrower leaved and with slenderly very acute bracts.

S. halophilum and *S. leptocaulon* both differ essentially from *S. oreophilum* by their thicker roots and smaller, thicker-walled, pale capsules.

The only other simple-stemmed species of any of the Pacific states, *S. idahoense* and *S. sarmentosum*, need no comparison with *S. oreophilum*, the former being a much larger plant in every way, and the latter differing conspicuously by its narrowly prolonged foliaceous bracts, besides narrower and weaker leaves and stems and smaller flowers.

***Sisyrrinchium Greenei* sp. nov.**

Mostly 25–45 cm. high, from fibrous, sometimes slightly thickened roots, pale or glaucescent green, often darkening or becoming brownish in drying. Leaves commonly about half the height of the plant and 1–3 mm. wide, sometimes rather thin and soft or becoming firm, varying from linear-attenuate and straight to acuminate and somewhat curved, narrowly acute, the delicate nerves approximate, or becoming well separated on the broader leaves, the edges smooth; stems commonly terminated by one or two, or even three, slender but mostly short peduncles subtended by a usually shorter erect bractal leaf, sometimes bearing a leaf and axillary peduncle lower down, casually simple with terminal spathe, 1–3 mm. wide, narrowly thin-margined or winged, the edges smooth or obscurely denticulate near the node; peduncles 3–10 cm. long, often extremely slender, slightly diverging and mostly a little unequal; spathes often purplish, usually narrow, 15–20 mm. long, the bracts rather firmly fine-nerved, equal, or either one slightly the longer, the outer one mostly acute, sometimes slightly foliaceous and becoming 2.5 cm. long, united-clasping below for .05–.07 mm., the inner one often scarious, obtuse; inner scales mostly about three-fourths the length of the bracts; flowers on slender, slightly exserted pedicels, delicate, pale violet-blue, about 10 mm. long, the segments short-aristulate; staminal column 5–6 mm. long; ovary glandular-puberulent; capsule subglobose or obovoid, brown, firm-walled, 3–7 mm. high; seeds numerous, apparently medium-sized.

Sierra Nevada Mountains from about midway in the state northward, extending into Oregon, ascending to at least 6,000 feet. Flowering mostly in June and July, although beginning to bloom in May, or even earlier, at lower altitudes. Named in honor of Professor Edward L. Greene.

Siskiyou County: North side of Mount Shasta, 5–9000 feet, June 11–16, 1897, *H. E. Brown*, no. 351 (type).

Modoc County: June 14, 1893, *M. S. Baker*.

Plumas County: Near Pratville, Mountain Meadow, 5,500 ft., July 2, 1897, *M. E. Jones*; July, 1896, 1897, 1898, *Mrs. R. M. Austin*.

Butte County: Little Chico Creek, May, 1896, Colby, July, 1896, *Mrs. R. M. Austin*.

Placer County: Applegate, May, 1899, *Mrs. Helen Smith*.

An inhabitant of the mountainous region of the north and northeastern part of the state, there replacing *S. bellum* of the coastwise counties and ascending to high altitudes.

It is ordinarily a smaller, more delicate plant than *S. bellum*, paler green in color and drying paler, and with much smaller flowers. So considerable, however, are the variations shown by the series of specimens at present necessary to refer to this species that little doubt need be entertained that more than one species is involved. Confident segregation, however, must await critical study of more complete material.

The type of *S. Greenei* may be taken as H. E. Brown's *no. 351*, from Mt. Shasta, of which I have seen four good sheets from as many herbaria and which is somewhat intermediate between extremes of the series.

Certain specimens from high elevations in Plumas County, as well as from Klamath Lake, Oregon (July, 1893, *Mrs. R. M. Austin*), are extremely delicate and slender throughout and bear only one or two terminal peduncles; other specimens are considerably stouter with broader and thinner leaves. A few specimens vary suggestively from the type by unusually long peduncles, broad thin leaves and sharply serrulate stems, and appear also to be earlier-flowering, several specimens having been collected in full flower in the month of May.

A particularly notable specimen more than doubtfully associated with the others here assigned is from near Pentz, Butte Co., collected by *Mrs. C. C. Bruce*, April, 1897 (*Herb. Cal. Acad. Sci.*), in full flower and with some mature fruit, although typical *S. Greenei* appears not to bloom ordinarily until June and July; these specimens are further remarkable for their greatly elongated stems and leaves, some being 70 cm. high, very pale and glaucous, peduncles in clusters of 2-5, and capsules very large, becoming 7 mm. high.

Sisyrinchium Eastwoodiae sp. nov.

Glaucous green, often brownish-tinged on the herbarium sheet, 20–60 cm. high; roots clustered, becoming slightly thickened towards the base. Leaves firm, with acute hardened tips, sometimes nearly equalling the stem but more often half its height, 1–3 mm. or even 4 mm. wide, firmly striate-nerved, the edges smooth or, in forms, roughened with minute points; stems erect, often flexuously curved, about the width of the leaves, flattened and narrowly winged to subterete and merely margined, the edges smooth or, in forms, bearing close-set, erect or retrorse cartilaginous points; node mostly one, high up, or sometimes two, its leaf shorter than the peduncles, often very short, stiff and bract-like; peduncles one to four, mostly short but sometimes very slender, 3–10 cm. long; spathes narrow, flattened, 1.3–2 cm. long, the bracts finely, but not very closely striate-nerved, the inner one commonly the longer and acuminate or apiculate from a scarious apex, the outer one cuspidate or stiffened to a short corneous tip, united-clasping for 4–8 mm. at base; inner scales equaling the shorter bract or sometimes much shorter; flowers rather numerous, 8–14, on erect or slightly spreading exserted pedicels, rather small; perianth 8–12 mm. long, the segments broadly short-aristulate from a usually slightly retuse apex, violet-purple, the yellow eye small; staminal column about 5 mm. long, ovary loosely glandular puberulent; capsule pale or dark brown, subglobose to obovoid or pyriform, thick-walled, sparsely puberulent, small, 2–4 mm. high; seeds 1–4 in each row, about 1.5 mm. in diameter, rugulose.

Valleys and mountains of Southern California extending into Lower California, not apparently reaching the coast; blooms from early May to July or later. Named in honor of Miss Alice Eastwood.

Kern County: Tehachapi, June 22, 1889, *Prof. E. L. Greene*; San Emidio Cañon, October 2, 1894, *Miss Alice Eastwood*.

San Bernardino County: San Bernardino Valley, in meadows, May, 1886, *S. B. & W. F. Parish*, no. 663 (type), also 1889 and 1888, by same collectors; San Bernardino, May 3, 1898, *S. B. Parish*, 1880, *G. R. Vasey*; San Bernardino Mountains and their eastern base, alt. 5,000 ft., June 28, 1894, *S. B. Parish*, no. 3045.

San Diego County: San Ysabel, May, 1893, *H. W. Henshaw*; Cuimaca Mountains, July 12, 1875, *Edward Palmer*, no. 374.

The above description of *S. Eastwoodiae* has been derived primarily from the plant of the San Bernardino Valley represented

mainly by the collections of S. B. and W. F. Parish. This is, apparently, the largest form of the species, frequently developing two leaf-bearing nodes, and with the basal leaves mostly about half the height of the close tufts, becoming even more than 4 mm. wide. This plant shows more or less discoloration on the herbarium sheet. It comes into flower in April and May.

Specimens collected by Professor Greene at Tehachapi, still flowering towards the end of June, are tall, pale in color, with long, slender, narrowly attenuate leaves and somewhat flexuous, very firm, smooth-edged stems with a single node and slender peduncle; the bracts of the spathe are narrow and firm, the shorter primary one with a stiff corneous tip.

Near this form may be placed a small, very different-appearing plant collected by Miss Alice Eastwood in San Emidio Cañon, Kern County, still flowering in October. Its leaves are short, especially the nodal leaf, the stems and peduncles very slender, the bracts mostly under 1.5 cm. in length, and the capsules only 2–2.5 mm. high; the outer bract shows the same hardened nail-like tip seen in the Tehachapi specimens.

In the absence of further material for study there may be referred here, also, Dr. Edward Palmer's *no.* 374, collected on mountains in the southern part of San Diego County in full flower, July 12th. These specimens are noteworthy in several ways, especially by reason of the harshly cartilaginous-ciliolate edges of leaf and stem and the roots which are distinctly woody-thickened toward the base; the bracts also appear to be more membranous than in the more northern plant and are mostly very acute, but without an indurated tip.

Another collection from the San Bernardino mountains must for the present find its place here also, although presenting many points of contrast. The stems are but 6–15 cm. high, many of them simple but others bearing two short peduncles; the leaves are short, relatively broad and mainly obtuse as are the broad short bracts, and both stems and leaves are more or less denticulate or even cartilaginous-ciliolate. This plant was collected by S. B. Parish in flower, June 28th, at an altitude of 5,000 ft., and though strikingly at variance with the valley plant may well be a modified sub-alpine form.

***Sisyrinchium funereum* sp. nov.**

Stiff and erect in scant tufts becoming 50–60 cm. high, pale glaucous-green, not discoloring when dry, the dead leaves and stems of the previous season, bleached to a light straw-color, persisting rigidly amid the fresh growth; roots soft and stout, mostly 2–3 mm. thick towards the base when dried and becoming over 30 cm. long. Leaves somewhat shorter than the stems, very smooth throughout, strongly close-nerved, 2–3.5 mm. wide, narrowly tapering to an acute, hard-pointed apex, their bases broadened and equitant; stems 2–4.5 mm. wide, stiff and straight, narrowly firm-margined and very smooth; node only one, high up, bearing a stiff, erect bracteal leaf 4–10 cm. long, subtending 2–3 longer approximate peduncles; peduncles slender, erect, straight or slightly curved, unequal, 4–12 cm. long; spathes erect or slightly bent, 18–23 mm. long, 2–3 mm. wide; bracts closely approximate, firmly close-nerved, the inner one usually slightly surpassing the outer, its tip white-scarious, obtuse, or even truncate or emarginate and apiculate, sometimes erose-denticulate; outer bract hyaline-margined nearly to the short-pointed apex, broadly so below, united-clasping for 5–7 mm.; inner scales crowded, silvery white, about equaling the bracts in length; flowers numerous, finally 12–18, on slightly exserted puberulent pedicels; perianth-segments violet-blue, 12–14 mm. long, contracted to a mucronate apex; staminal column about 5.5 mm. high; ovary densely glandular-puberulent; pedicels fascicled, stiff and erect, or somewhat diverging above, the weaker ones sometimes spirally flexuous; capsules light-colored, thick-walled, 3–6 mm. high, oblong-ovoid to broadly ovoid, often truncately contracted above and below, more or less distinctly moulded over the seeds; seeds rather few, 2–4 in a row on slender stipels from central placentae, mostly globose and 1.5 mm. in diameter, black, rugulose, reticulate, not umbilicate.

Furnace creek cañon, Funeral Mountains, January 27, 1891, *Frederick V. Coville & Frederick Funston*, Death Valley Expedition of the U. S. Department of Agriculture, no. 225.

A striking species, tall and stiff and very pale in color, with appressed peduncles, rather large flowers and greatly developed root-system. The persistence from one flowering season to another of the dried and rigidly erect leaves and stems is a noteworthy characteristic of the plant. It would appear from the single collection of the species so far made that the seeds of one season were carried over to the succeeding one to be released when the plant came again into flower.

SISYRINCHIUM BELLUM S. Watson, Proc. Am. Acad. **12**: 277. 1877.

Remarkably variable in size and relative proportions; from 6 cm. to over 6 dm. high, mostly 2.5–4 dm., green to glaucescent, subject to slight or to pronounced discoloration on the herbarium sheet, the tufts often fibrillose at base, the roots either slender or somewhat thickened, frequently from an ascending or horizontal, sometimes compound, woody rootstock. Leaves soft and rather thin, or becoming firm, finely many-nerved, sometimes equaling the plant in height but usually shorter, mostly 2–4 mm. wide (1–6 mm.), acute or aculeate, the edges smooth or denticulate; stems erect, stout or slender, 1–4 mm. wide, narrowly firm-margined to narrowly winged, the edges smooth or denticulate; sides of leaves, bracts and stems rarely obscurely roughened with harsh points; primary node supporting from 2–4 peduncles or one or two branches each with 1–2 peduncle-bearing nodes; primary stem-leaf conspicuous, the bracteal leaves usually much reduced; peduncles stout or very slender, straight or curved, divergent or erect, sometimes very short but becoming 18 cm. long; spathes very variable, linear, lanceolate, or short oblong, 1.5–6 mm. wide when pressed, the bracts green or purplish, very acute to obtuse, straight to strongly incurved, subequal or very unequal, when subequal 1.5–3 cm. long, when very unequal foliaceous and reaching a length of 3.5 cm. for the inner and 5.5 cm. for the outer bract; bracts finely many-nerved, the edges often conspicuously white or purplish margined, the outer one united-clasping below for from $\frac{1}{4}$ to $\frac{1}{2}$ its length; inner scales mostly brownish tinged, sometimes equaling the bracts, but usually much shorter; flowers on slightly or slenderly exserted erect or diverging pedicels, varying in color from blue and violet to lilac, in light and dark shades, in one specimen pure white; segments sharply emarginate or contracted to the mucronate or aristulate apex, 12–20 mm. long; column 5–7 mm. high; ovary glandular-puberulent to glabrous; capsules dark or pale brown, depressed-globose to obovoid or pyriform, in some forms strongly trilobulate, 2–7 mm. long; seeds 1 or 2 to 5–6 in each row, about 1.5 mm. in diameter, dark, pitted, subglobose.

Apparently common in all the coastwise counties from San Diego to Mendocino, extending from the immediate coast back into the mountains, but no evidence has developed of its occurrence in any of the inland counties.

In the southern part of the state the species begins to flower in February and March, and sometimes even in March in the neighborhood of San Francisco. At its northern limit flowering begins in May and June, continuing into July and August.

San Diego County : San Diego, 1850, *C. C. Parry*; May, 1852, *Geo. Thurber*; April, 1866, *Weed*; 1882, *C. G. Pringle*; 1884, *C. R. Orcutt*; 1885, *E. L. Greene*; February 19, 1891, *Alice Eastwood*; Delmar, April 16, 1895, *Belle S. Angier*; Fall Brook, March 17, 1882, *Marcus E. Jones*.

Los Angeles County : Los Angeles, April, 1888, *Dr. H. E. Hasse*; March 14, 1890, *Fritchley*; San Gabriel, March 23, 1854, *Dr. J. M. Bigelow*.

Santa Barbara County : Santa Barbara, 1874, *Miss S. P. Monks*.

Monterey County : Santa Lucia Mountains, August, 1885, *T. S. Brandegee*; April, 1898, and May 20, 1897, *R. A. Plaskett*.

Santa Cruz County : *Horace Davis*.

San Mateo County : Purisima, April, 1898, Blenheim, May 19, 1901, *Alice Eastwood*.

Alameda County : Salinas Plains, March, 1866, *A. Wood*; Berkeley, 1882, 1886, *E. L. Greene*; 1892, *Michener & Bioletti*; Point Isabel, June, 1900, *Alice Eastwood*.

San Francisco County : near San Francisco, *Dr. A. Kellogg*, 1866; March, 1892, *Michener & Bioletti*; May, 1894, *Alice Eastwood*.

Marin County : April, 1895, *Alice Eastwood*.

Solano County : 1866, *A. Wood*; Bernicia, *Rev. J. P. Moore*.

Sonoma County : *E. Samuels*; Bodega Point, July 4, 1900, Hood Mountain, April 27, 1893, Altruria, April 7, 1900, *Alice Eastwood*.

Mendocino County : Long Valley, 1871; May, 1898, June, 1898, *H. E. Brown*; Red Mountain, Strong Mountain, May 21-28, 1906, Fort Bragg, August 9, 1902, *Alice Eastwood*.

Although no specific type of *Sisyrinchium bellum* is cited by Dr. Watson, a number of sheets labeled by his hand are preserved in the Gray Herbarium. Among these are excellent examples of the stout and large-flowered coastwise plant which Dr. Watson's description further unmistakably defines. There need be no doubt, therefore, as to the right application of the name *Sisyrinchium bellum*, notwithstanding the existence of several sheets so labelled by Dr. Watson, which, as it now appears, really represent other species.

Even as here delimited, however, *S. bellum* is still quite cer-

tainly an aggregate, and certain further lines of subdivision not yet clearly shown may confidently be expected to reveal themselves to careful field observation and the study of ample material.

In the more southern coastwise counties of the state occurs a form commonly more tufted, smaller and more branched than the type, often more fibrillose about the base and usually turning much darker on the herbarium sheet; other comparative differences appear in very slender erect peduncles, smaller spathes with subequal often sharply apiculate or aculeate bracts, smaller flowers and small, dark, trilobulate capsules only 2-4 mm. high.

In marked contrast with this is another form apparently confined also to the southern coastwise counties which discolors less when dry and is tall and stout, with rather short, curved peduncles, short, oval spathes with mostly equal, often obtuse bracts, and apparently larger flowers with broader less slenderly aristulate segments.

Similar to the type, but usually lower and less branched and with shorter peduncles, is a form apparently best developed somewhat northward in the range of the species which is noteworthy for its conspicuously foliaceous and often greatly elongated unequal bracts; in this plant the ovary is sometimes, at least, quite glabrous.

Also from northward in the range of the species, especially from Mendocino County, come a few specimens very slender throughout having mostly two slender approximate peduncles, narrow, very acute bracts, much exserted pedicels, the flowers with narrow segments, and small, subglobose, few-seeded capsules.

Still further rather suggestive indications of other species are afforded by certain imperfect or fragmentary specimens of little use to discuss at the present time.

***Sisyrinchium hesperium* sp. nov.**

Slender, erect or ascending in thin, somewhat open tufts sparsely fibrillose at base, 25-40 cm. high, dull green and glaucescent becoming brownish in drying, the slender roots numerous and densely clustered. Leaves thin and soft or becoming firm, half the height of the stem or less, 1-3 mm. or even 4 mm. wide, usually narrowed towards the base, tapering-acute, straight or slightly falcate, the edges smooth or obscurely denticulate-roughened; stems fragile, 1-2.5 mm. wide, merely margined, or with

narrow finely nerved wings, the edges smooth or slightly denticulate; peduncles 1-3, erect or diverging, long and very slender, 5-14 cm. in length; spathes narrow, 15-25 mm. long or the outer bract longer; bracts membranous, narrow, often attenuate, delicately nerved, mostly cuspidate-acute and often narrowly aristulate, distinctly white-margined, the outer one united-clasping below for 5-10 mm., sometimes for half its length; inner scales narrow, attenuate, about three-quarters the length of the bracts; flowers on hair-like exserted pedicels, deep violet-purple, perianth about 10 mm. long; staminal column about 5 mm. long; capsules often on flexuously spreading pedicels, brown, thin-walled, obovoid-pyriform to subglobose, 3-5 mm. high, slightly puberulent; seeds only 2-4 in each row, large, becoming 1.5 mm. or more in diameter, rugulose.

Near the boundary between Santa Barbara and San Luis Obispo Counties, Dutard's Ranch, May 9, 1896 (type).

Fresno County: Wauthan, May 11, 1893.

Monterey County: Melpitas Ranch, Santa Lucia Mountains, May 1-12, 1899.

All in flower and early fruit and collected by *Miss Alice Eastwood*. In Herb. Cal. Acad. Sci.

A much more slender and delicate species than *S. bellum*, often very fragile, with long, very slender peduncles, smaller, more delicate flowers on hairlike, mostly flexuously exserted pedicels, and smaller, thinner-walled capsules.